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Need for Hospital ward Pharmacists to Confirm Patient's Own Medications

Junichi Araki[1], Kayoko Furuya[1], Dai Kamemura[1], Isamu Murata[2], Yutaka Inoue[2]*, Shigeru Ohshima[2] and Ikuo Kanamoto[2]

[1]*Department of Pharmacy, IMS Fujimi General Hospital, Japan*
[2]*Faculty of Pharmaceutical Sciences, Josai University, Japan*

***Corresponding author:** Yutaka Inoue, Faculty of Pharmaceutical Sciences, Josai University; 1-1 Keyakidai, Sakado-shi, Saitama, 3500295, Japan, Tel: +81-49-271-7317; Fax: +81-49-271-7317; **E-mail:** yinoue@josai.ac.jp

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Abstract

Objective: The aim of this study was to devise a medication management scheme that would lead to improved patient adherence, the current study ascertained the state of patients' own medications upon admission and it compared those medications.

Methods: This study was conducted at IMS Fujimi General Hospital over a 1-month period from September to October 2015. The obtained information was compiled for each ward and compared among wards. There were 290 inpatients during the period studied with an average age of 70.4 years.

Results: Of the 290 patients, 206 (71.0%) brought medications with them. Of the 206 patients who brought their own medications, 164 kept a medication diary. Patients brought an average of 6.7 medications with them, and those medications were prescribed by an average of 1.5 hospitals. The timing of dosing was most often "after breakfast," followed by "after meals" and "after breakfast and dinner." Checking patients' own medications is crucial in validating their medical conditions and characteristics.

Conclusion: A system should be created in which physicians coordinate with other medical personnel such as pharmacists to improve patient care.

Keywords: Medication management; Patient adherence; Risk management

Introduction

In the Japanese system of medical care, pharmacists perform various duties, such as preparing and dispensing prescribed medication, instructing patients on taking medication (e.g. explaining dosing and dosages), facilitating at-home care by visiting patients at home and managing their medication, engaging in therapeutic drug monitoring (TDM) (i.e. measuring drug levels in the blood and estimating doses), engaging in aseptic preparation of solutions such as total parenteral nutrition (TPN) as part of safety measures to prevent infections, and provision of drug information (DI) (i.e. compiling the latest DI and providing DI to medical personnel) [1-8]. A hospital pharmacist not only supplies and manages drugs, but also functions as a key participant in team care. Team care can fully capitalize on a pharmacist's competence by allowing the pharmacist to propose medication tailored to the patient's condition and treatment status and by allowing the pharmacist to provide appropriate drug therapy (e.g. the proper use of drugs). Medication management and instruction were first recognized as inpatient services provided by pharmacists in 1988, when a fee for those services was included in the fees for services during hospitalization. In 2012, hospital pharmacists were tasked with planning, monitoring, and advising on inpatient medication (reflected in a fee added to the basic hospitalization fee). In 2016, a new system of added fees was created to promote team care and to include pharmacists in advanced acute care in intensive care units (ICUs). Government regulations on medical fees require every ward to be staffed with a pharmacist. As described in The Provision of Inpatient Services by Pharmacists (ver.1.2) of the Japanese Society of Hospital Pharmacists, the inpatient services provided by pharmacists can be categorized into planning and advising on inpatient medication prior to its administration and medication management and instruction after medication is administered. Medication management and instruction after medication include: 1) checking the patient's drug history, 2) checking what medication has been prescribed, 3) dealing with high-risk medications or narcotics, 4) explaining medication to patients and instructing patients on how to take that medication, 5) instructions upon discharge, and 6) keeping medication management and instruction records. Planning and advising on inpatient medication prior to its administration include: 1) ascertaining patient information and proposing medication, 2) providing DI and providing information to physicians, 3) responding to health hazards due to adverse reactions, 4) liaising with other medical personnel, 5) properly supplementing and managing inpatient medication, and 6) keeping a duty log. Managing a patient's own medications can be considered part of planning and advising on inpatient medication prior to its administration. Drawing on information gleaned from patients' interviews and their own medications, a pharmacist checks for medication that may warrant caution during inpatient treatment. This check involves aspects such as patients' compliances, allergy history, history of adverse reactions, and drug interactions. The pharmacist must provide this information to physicians and assist with and propose medication. Numerous studies have described efforts by pharmacists to survey patient's own medications and their outcomes. As an example, one study indicated that information on patient's own medications may help to halt medication prior to surgery [9], and another study suggests the effects of pharmacist intervention on emergency department are more effective when patients are taking fewer drugs [10]. Thus, a pharmacist's active involvement in medication management during hospitalization has become an established component of team care.

IMS Fujimi General Hospital is an acute care hospital with 221 beds, 20 departments, 5 wards, and 2 units (a high care unit (HCU) on the 4th floor and a stroke care unit (SCU) on the 5th floor). The pharmacy at this hospital is staffed by 21 pharmacists. In 2012, every ward was staffed with a full-time pharmacist providing inpatient services. In addition, each ward is staffed with 1-2 pharmacists who provide both inpatient services and pharmacy services. Thus, a seamless system of providing inpatient services has been created. An overview of the wards of IMS Fujimi General Hospital is shown in table 1. When patient's own medications are surveyed at IMS Fujimi General Hospital, a pharmacist checks the medications and he or she provides information on those medications to physicians. A patient's own medications refers to any medication a patient has been taking prior to admission and any "remaining medication," which is medication a patient has been prescribed but that he or she is not taking. In other words, the survey of patients' own medications includes patient compliance with medication. This helps a physician to prescribe medication that will result in better patient adherence. Even though pharmacists collect information on inpatients, they are unable to facilitate medication by capitalizing on information such as patient characteristics and their compliance with their own medications. If the information provided by pharmacists could be revised for use within the hospital and that information could be more easily shared within the facility, then patients could receive better care. Thus, the current study sought to examine how to better share that information in order to devise medication that would lead to improved patient adherence. A medication diary needs to be incorporated in a patient's medication information, so this study also examined the percentage of patients who kept a medication diary.

Methods

Patients and study period

This study was conducted over a 1-month period from September to October 2015. Of 294 patients who were admitted to IMS Fujimi General Hospital for the first time, 206 brought medications with them. Patients were from all wards except the Pediatrics ward.

The patient's own medication chart and checklist

Medication was identified using a patient's own medication chart (Figure 1) in an electronic pharmacy system. This study used a checklist to obtain detailed information on patient's own medications that were identified. Items on the checklist were "the number of inpatients," "the percentage of patients with the own medications," "the sex ratio of patients" with their own medications, the patient's "age," "the time taken to identify medications (the time needed to create a patient's own medication chart," "the number of patient's own medications," "the number of medical facilities that prescribed patient's medications," "the prices of patient's own medications," the patient's "residence prior to admission," "management of medications," "whether or not the patient has remaining medications," "whether the patient has a medication diary," and "details in the medication diary." Normally, pharmacists serving in additional capacities identify patient's own medications along with full-time pharmacists. In this study, all pharmacists identified patient's own medications and they administered the checklist.

Floor	Beds	Pharmacists [Full-time/ Concurrently]	Clinical department
4F・HCU	38	[1/2]	Cardiology Cardiovascular Surgery
5F・SCU	41	[1/2]	Surgery, Vascular Surgery Urology, Cranial nerve surgery
6F	45	[1/2]	Internal medicine
7F	45	[1/2]	Pediatrics
8F	45	[1/1]	Orthopaedic Surgery Plastic and Reconstructive Surgery

Table 1: Outline of hospital ward

Patient's own medication chart

ID ○○○○○○
Name XXX XXXX
Birthday ○○○○/○○/○○
Age ○○years (Sex)

Date confirmed:
20○○/○○/○○

*Filing this form in the medical record.
*When dispensing medicines to be brought, in principle, they should be packed in the minimum number of items and packed up.
*Half ends should be kept in the pharmaceutical department.

○: adopted ◇: same drug
△: same active drug ×: not adopted

Docter's name sign	

Pharmacist's name :

No.	At hospitalization	Chemical name / Medicinal effect	Dosage regimen (To change, to the remarks column)	Remark column	Quantity	Hiring	Recruit drug/ The same effect drug
1.	Continuation						
	Stop						
2.	Continuation						
	Stop						
3.	Continuation						
	Stop						
4.	Continuation						
	Stop						
5.	Continuation						
	Stop						

OTC medicine, marketing medicine, health food etc. (Yes /No)	Taking date (after hospitalization)
	○/○ morning・noon・evening・before bed
	Minimum number of packaging days: ○ days worth
Notice matter	Information source
	* Person in charge * Family * Medical chart * Petty situation * Medicine diary * Dispensing pharmacy Other

Figure 1: Patient's own medication chart

Interventions based on the survey of patient's own medications

Based on the information obtained from the survey of patient's own medications, a patient's own medication chart was used to provide information on those medications to physicians. Information from the patient's own medication chart and the checklist that a supervising pharmacist deemed essential for a patient's future care was listed in the patient's chart and provided to physicians. The obtained information was compiled for each ward and compared among wards, and investigated.

Ethics and Approval

This study was approved by the ethics committee of IMS Fujimi General Hospital.

Results

The number of patients in individual wards and in the hospital overall, the percentage of inpatients with their own medications, the sex ratio of those patients, patient age, the time taken to identify medications, the

number of patient's own medications, the number of medical facilities that prescribed patient's medications, and the prices of patient's own medications during the study period are shown in table 2. Of 294 new admissions, 206 patients (70.1%, male/female: 109/97) brought medications with them. Patients with their own medications had a mean age of 70.7 ± 14.2 years. Pharmacists needed an average of 12.4 min to identify patient's own medications, and patients brought an average of 6.6 medications. In the HCU, the time needed to identify patient's own medications was an average of 15.9 min and patients brought an average of 7.6 medications with them. In the SCU, the time needed to identify patient's own medications was an average of 9.1 min and patients brought an average of 5.4 medications with them. In wards on the 6th floor, the time needed to identify patient's own medications was an average of 15.0 min and patients brought an average of 8.1 medications with them. In wards on the 8th floor, the time needed to identify patient's own medications was an average of 10.0 min and patients brought an average of 5.6 medications with them. As indicated, the time needed to identify patient's own medications and the number of patient's own medications differed among units and wards. An average of 1.4 ± 0.8 medical facilities prescribed patient's medications. The price of patient's own medications was an average of 9,987 ± 14,228 yen.

Patient information prior to admittance such as residence, management of medication, and whether or not patients had remaining medications is shown in table 3. Results indicated that 190 patients (92.2%) were living at home prior to admission, 11(5.3%) were residing in a facility, 4(2.0%) were inpatients at another hospital, and the residence of 1 patient (0.5%) was not known. Medication was managed by 168 of the patients themselves (81.6%), by someone else for 34(16.5%), and the way in which medication was managed was not known for 4 patients (1.9%). Seventy-eight patients (37.8%) had remaining medications, 122(59.2%) did not, and whether or not 6 patients (3.0%) had remaining medications was not known.

Reasons as to why patients had remaining medications are listed as the following "I'm scheduled to be hospitalized for a certain amount of time, so I only brought the amount of medication I would need while here," "Medication that I've been taken off of is still at home," "I didn't think I needed to bring my medications with me," and "I haven't taken all my medication like I should."

The number of patients with a medication diary and how that diary was used are shown in table 4. One hundred and thirty-nine patients (67.5%) had a medication diary while 67 (32.5%) did not. Of the 139 patients with a medication diary, 128 were able to successfully keep the diary while 11 were not. Of the 67 patients who did not have a medication diary, 31 forgot how to keep it, 23 did not keep it, and the reason why 13 patients did not keep a medication diary was not known.

The timing of dosing and the top 5 therapeutic classes of patient's own medications are shown in tables 5 and 6. Five hundred and twenty-three medications (38.7%) were taken "after breakfast," 227 (16.8%) were taken "after meals," 167 (12.3%) were taken "after breakfast and dinner," 99 (7.3%) were taken "before bed," 91 (6.7%) were taken "after dinner," and

	4F・HCU	5F・SCU	6F	8F	Total
Inpatients	73	101	66	54	294
Number of inpatients/ Percentage of patients	60/82.2	68/67.3	41/62.1	37/68.5	206/70.1
Sex ratio (male/female)	35/25	43/25	15/26	16/21	109/97
Age	70.0 ± 11.9	71.0 ± 12.0	71.0 ± 16.0	69.9 ± 19.3	70.7 ± 14.2
Time taken to identify medications (min)	15.9 ± 11.4	9.1 ± 7.4	15.0 ± 7.1	10.0 ± 5.9	12.4 ± 9.0
Number of patient's own medications (drug)	7.6 ± 3.7	5.4 ± 3.6	8.0 ± 4.3	5.6 ± 3.8	6.6 ± 4.0
Number of medical facilities	1.4 ± 0.9	1.3 ± 0.7	1.4 ± 0.9	1.4 ± 0.7	1.4 ± 0.8
Prices of patient's own medications (yen)	12,827 ± 14,859	7,868 ± 12,312	11,152 ± 13,659	8,223 ± 16,662	9,986 ± 14,228

Table 2: Confirmation items of each hospital ward
Mean ± S.D

		4F・HCU	5F・SCU	6F	8F	Total
Residence prior to admission	Home	59	64	31	36	190
	Facility	1	2	8	0	11
	Hospital	0	2	1	1	4
	Unknown	0	0	1	0	1
Management of medication	Self	58	56	25	29	168
	Others	2	11	13	8	34
	Unknown	0	1	3	0	4
Whether or not the patient has remaining medications	Remaining	30	25	8	15	78
	Not remaining	30	42	28	22	122
	Unknown	0	1	5	0	6

Table 3: Patient information on own medications before hospitalization

		4F・HCU	5F・SCU	6F	8F	Total
Bring medication diary	Bring	59	64	31	36	190
	Do not bring	1	2	8	0	11
Available of medication diary	Available	0	2	1	1	4
	Not available	0	0	1	0	1
	Forget bringing	58	56	25	29	168
	Not used	2	11	13	8	34
	Unknown	0	1	3	0	4

Table 4: Patient information on medication diary

Timing of dosing	Medications (%)
After breakfast	523 (38.7)
After meals	227 (16.8)
After breakfast and dinner	167 (12.3)
Before bed	99 (7.3)
After dinner	91 (6.7)

Table 5: Timing of dosing the top 5 (n=1352)

Therapeutic classes	Medications (%)
Anticoagulant	151 (11.1)
Coronary vasodilator	137 (10.1)
Medication to treat a peptic ulcer	117 (8.7)
Medication to lower blood pressure	102 (7.5)
Medication to treat hyperlipidemia	76 (5.6)

Table 6: Therapeutic classes the top 5 (n=1352)

245(18.2%) were taken at some other time. Of patient's own medications, 151 (11.1%) were an "anticoagulant," 137 (10.1%) were a "coronary vasodilator," 117 (8.7%) were a "medication to treat a peptic ulcer," 102 (7.5%) were a "medication to lower blood pressure," 76(5.6%) were a "medication to treat hyperlipidemia," and 769(60.0%) were some other therapeutic class.

Several reasons why patients failed to comply with their medication were because "I can't take the form [preparation] I was given," "I've been seen by a number of medical facilities, and they specify different forms of dosing," "I decided to stop taking my medication because of side effects or symptoms it caused."

Discussion

Over the past few years, the topic of risk management has become inextricably linked to medical care. According to the City of Tokyo's Tallied Results of Incident and Accident Reports at Municipal Hospitals, 33% of reported incidents involved medication, accounting for 2.75 incidents per day. Several studies have cited the advantages of staffing wards with a pharmacist. Inpatient services provided by a pharmacist result in a significant increase in the number of pharmaceutical interventions that can be performed and they reduces the number of incidents [11,12]. A study has also reported that the inpatient services provided by a pharmacist reduce the risk associated with Adverse Drug Events [13]. In light of these facts, having a pharmacist identify patient's own medications and having a pharmacist draw on patient information can help medical; personnel provide patients with better care.

Tabulation revealed that an "anticoagulant" was the top therapeutic class of medications that patients brought with them (Table 6). An anticoagulant was presumably prescribed by Cardiovascular Medicine or Cardiovascular Surgery for anticoagulation. A pharmacist needs to ascertain the characteristics of that medication to avoid adverse reactions (e.g. a tendency to bleed) and interaction with other drugs and to discontinue the anticoagulant prior to surgery. Thus, a pharmacist must identify high-risk medications such as anticoagulants when checking a patient's own medications and a pharmacist must ascertain the patient's status and inform the physician of that status.

One noteworthy result of the current study is that patients who brought their own medications were 70.7 years of age, on average (Table 2). That said 81.6% of patients who brought their own medications managed those medications themselves. Japan has an aging population, so making medication management easier will help improve patient adherence and facilitate proper use of medication (Table 3). In addition, medications that patients brought with them were often taken "after breakfast" (16.8%) and some other time (18.2%) (Table 5). One option may be to have patients take all of their medications at the same set times, to the extent possible. Such an approach would help to prevent patients from forgetting to take their medication. In addition, results revealed several problems with the medication patients were given, such as "I've been seen by a number of medical facilities, and they specify different forms of dosing" and "there are times when I can't take my medication because I have to work." Moreover, taking a medication at the wrong time as a result of being given multiple medications, redundant prescriptions, and drug interaction are also problems [14-16]. A pharmacist should collect information on patients and advise a prescribing physician while capitalizing on information in the patient's medication diary. A pharmacist should endeavor to reduce unnecessary medication and to provide patients with the medications they need.

A comparison of different units and wards revealed that patients in the SCU (for Surgery and Neurosurgery patients) and wards on the 8th floor (Orthopedics and Plastic Surgery) brought few medications with them (Table 2). Since they brought few medications with them, pharmacists needed less time to identify those medications. Pharmacists can be better allocated in light of this finding. In the current study, the total price of patient's own medications was an average of 9,986 yen (about 86 dollars (with 115 yen/1 $)) per person (Table 2). Seventy-eight patients who brought medications with them (37.9%) had remaining medication (Table 3). Since patients had remaining medication at home, the total price of their medications would presumably be higher. Medication should be properly used and managed.

A survey of patient's own medications at IMS Fujimi General Hospital revealed what medications patients in different wards brought with them. Patients at IMS Fujimi General Hospital brought an average of 6.6 medications with them. This number is higher than 3.8 medications, which is the number of prescriptions filled at a pharmacy according to the Overview of 2015 Statistics on Medical Care and Services under Public Health Insurance (Table 2). The number of patient's own medications means that patients are seen by a vast range of medical facilities, and it suggests that integrated management of what medications a patient has been given by other departments would be difficult. One technique for the integrated management of prescribed medications in Japan is a standardized "medication diary." A medication diary lists what medications were taken in the hospital and elsewhere, allowing integrated management of what medications were taken and any history of adverse reactions or allergies [17]. Medical personnel such as a physician or pharmacist at another medical facility can check a patient's medication diary without needing to contact the patient's primary physician, and information on what medication a patient is taking for a given illness can be verified during the current course of treatment. This information is clearly indicated in the medication diary, which is an advantage of keeping such a diary. A medication diary can help to prevent the redundant prescription of drugs with the same action and it can help provide safe and reliable drug therapy.

One hundred and thirty-nine patients (just under 70%) had a medication diary (Table 4). Since patients are seen by multiple medical facilities, integrated management of medication is difficult, and simply asking a patient about his or her medication or examining the medication itself would probably result in a lack of specifics. As an example, managing important drug information such as adverse reactions and allergies is difficult. Similarly, the current results revealed that a patient had decided to stop taking nicorandil tablets because they caused headaches. Aggregating and integrating this information will help ensure that medical care continues to be provided safely and reliably. In addition, that information can provide a useful bridge between patients and medical

personnel. Documenting laboratory results, vital signs, and changes in a patient's condition after taking medication, even if done briefly, will result in prompt and accurate care. Thus, a medication diary is a useful tool for patients, and pharmacists need to educate patients about the usefulness of that diary.

Checking patient's own medications is crucial in terms of ascertaining information on a patient's medications and in terms of ascertaining a patient's illness and his or her characteristics. Thus, a pharmacist needs to be promptly involved when a patient is admitted, and information gleaned by the pharmacist should be fed back to physicians and other medical personnel. The usefulness of team care is currently being touted, and medical personnel need to more aware of what medication a patient is taking. Both physicians and pharmacists need to interact with patients and cooperate to select medication that meets a patient's needs. A physician has the authority to write a prescription. Nonetheless, a system should be created in which physicians coordinate with other medical personnel such as pharmacists to improve patient care. Currently, about 25% of the population of Japan is elderly people over 65 years old. And, in many advanced countries in the aged society, it was examined how the pharmacist should intervene about the medication history of the patient. In future, comparative research with other age groups should be planned.

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Conflicts of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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